

## REMARKS

Claims 3, 5-8, 10, 43 and 56-59 are cancelled herein without prejudice or disclaimer and Applicant reserves the right to claim subject matter of the cancelled claims in one or more continuing patent applications. Claims 1, 4, 42 and 44 are amended herein and claims 60-73 are new. Basis for the amendments and the newly claimed subject matter is in the claims as originally filed and in specification throughout. Representative basis for chromosome positions is in paragraphs 0224, 0234 and 040 of the specification, for example. Accordingly, entry of the claim amendments and new claims will not introduce any prohibited new matter.

The Office rejected claims in the outstanding action for alleged lack of written description, alleged lack of enablement and alleged anticipation, which are summarized hereafter:

- i. Claims 1-4, 7-10, 42-45 and 56-59 were rejected under 35 U.S.C. 112, first paragraph, for the specification allegedly lacking a written description;
- ii. Claims 1-4, 7-10, 42-45 and 56-59 were rejected under 35 U.S.C. 112, first paragraph, for the specification allegedly lacking an enabling disclosure; and
- iii. Claims 56, 58 and 60 were rejected under 35 U.S.C. 102(b) for alleged anticipation by Severin.

Claim rejections in the outstanding Office action are traversed, and are moot in view of the amendments herein. Applicant does not necessarily accept or agree with rejections set forth in the Office action, and the claim amendments, claim cancellations and new claims are submitted herein for the purpose of expediting prosecution. Remarks in response to the outstanding claim rejections are set forth hereafter.

### Rejection for Alleged Lack of Written Description

The Office rejected claims 1-4, 7-10, 42-45 and 56-59 for the specification allegedly lacking a written description of the claimed subject matter. Applicant respectfully notes the rejection is inapplicable to claims 3, 7-8, 10, 43 and 56-59 as they are cancelled herein without prejudice or disclaimer, and the rejection is

inapplicable to amended claims 1, 4, 42 and 44 and the remaining claims. The rejection is traversed in view of the reasoning presented hereafter.

Well-accepted principles of genetics support a finding that Applicant's specification provides a written description of the claimed subject matter. The concept of linkage disequilibrium in genetics embodies the phenomenon that a disease-associated region in the human genome contains a cluster of polymorphisms associated with a disease state. Specifically,

markers very close to the disease gene will tend, more likely than average, to retain the haplotype of the original chromosome because, as the distance to the disease gene shrinks, it becomes less likely that recombination events will have occurred in this particular region.

From Cantor & Smith, *Genomics: The Science and Technology Behind the Human Genome Project*, 1999, John Wiley & Sons, Inc., New York, page 192. Thus, identifying multiple polymorphisms associated with a disease state also identifies a region associated with the disease state consistent with the concept of linkage disequilibrium.

The specification analyzed several polymorphisms in the region of the human genome specified by claims 1 and 42 – chromosome positions 117912256 to 117995524 according to Build 31 of the GenBank database – and identified several associated with breast cancer. For example, please see Tables 12 and 17 on pages 70 and 76 of the specification, which identified six (6) polymorphisms associated with breast cancer with a p-value of less than 0.05 of the sixty (60) polymorphisms analyzed in the claimed region. Thus, the specification provided a written description for the claimed subject matter in the specification because Applicant disclosed several polymorphisms associated with breast cancer in the claimed region, and thereby identified the region as being associated with breast cancer in accordance with principles of genetics.

Further, Applicant analyzed a representative number of polymorphisms in the region designated by claim 1 in the process of identifying a subset of polymorphisms associated with breast cancer. Applicant has determined from a current search of the HapMap database (July 2006 release) that 182 single nucleotide polymorphisms have been genotyped in the region designated by claim 1. In the subject specification, Applicant analyzed 60 single nucleotide polymorphisms in this region before the filing date of November 25, 2003. For example, Table 12 on page 70 of the specification analyzed 58 of the polymorphisms and Table 17 on page 76 of the specification analyzed two newly-identified polymorphisms. Further, of the 182 polymorphisms in the HapMap database in this region, only 78 have a frequency of 0.05 or more. Of the 60 polymorphisms analyzed in Applicant's specification, however, 43 have a frequency of 0.05 or more.

Thus, Applicant (i) analyzed about one-third (33%) of the number of single nucleotide polymorphisms in the region reported in the HapMap database, (ii) analyzed over half (55%) of the number of single nucleotide polymorphisms in the region reported in the HapMap database having a frequency of 0.05 or more, and (iii) identified a subset of polymorphisms associated with breast cancer. The specification therefore provides a written description for the claimed subject matter as Applicant analyzed a representative number of polymorphisms in the claimed region of human DNA.

Accordingly, the specification provides a written description of the claimed subject matter consistent with 35 U.S.C. 112, first paragraph. Applicant therefore respectfully requests withdrawal of the rejection.

Rejection for Alleged Lack of Enablement

The Office rejected claims 1-4, 7-10, 42-45 and 56-59 for the specification allegedly lacking an enabling disclosure of the claimed subject matter. Applicant respectfully notes the rejection is inapplicable to claims 3, 7-8, 10, 43 and 56-59 as they are cancelled herein without prejudice or disclaimer, and the rejection is

inapplicable to amended claims 1, 4, 42 and 44 and the remaining claims. The rejection is traversed in view of the reasoning presented hereafter.

Applicant's specification identifies a region specified in claims 1 and 42 associated with occurrence of breast cancer. Given the discussion regarding genetics principles above, Applicant's finding paves the way towards identifying and using polymorphisms of this region in the claimed methods. Applicant's finding that the region specified in claims 1 and 42 is associated with breast cancer is useful for guiding the person of ordinary skill in the art towards routinely identify any other polymorphisms associated with breast cancer in that region. The routine nature of any experimentation extending beyond the results described in Applicant's specification is underscored by the clear teachings and guidance in the specification, as elucidated hereafter.

The specification provides multiple working examples in support of the claimed subject matter, an *Ex Parte Foreman* factor bearing on enablement addressed in *In re Wands*, 858 F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988). For example,

- (i) paragraphs 0215 to 0223 describe methodology for identifying polymorphisms associated with breast cancer in DNA from a human subject;
- (ii) paragraphs 0224 to 0229 describe methods and components for identifying polymorphisms associated with breast cancer in DNA from a subject in the region specified by claims 1 and 42;
- (iii) paragraphs 0230 to 0234 describe deep sequencing and genotype analysis of polymorphisms associated with breast cancer; and
- (iv) paragraphs 0208 to 0209 describe methods for isolating DNA from human blood samples.

In addition to this set of working examples for performing the claimed methods, the specification also provides clear guidance to the person of ordinary skill in the art for the scope of the claimed subject matter, another factor addressed in *In re Wands* (supra). For example, the specification in paragraphs 0100 to 0104 provides clear guidance for performing multiple types of assays useful for identifying polymorphisms associated with breast cancer.

The Court of Appeals for the Federal Circuit (CAFC) has found some experimentation is acceptable to produce an invention, and routine experimentation does not preclude a finding of enablement (*Monsanto Co. v. Scruggs*, 459 F.3d 1328; 79 USPQ.2d 1813 (Fed. Cir. 2006) and *In re Wands* (supra)). Given that the working examples and clear guidance in the specification teach multiple methods for identifying polymorphisms associated with breast cancer, the person of ordinary skill in the art could apply these methods in a routine manner to polymorphisms in the region specified by claims 1 and 42 and perform the claimed methods.

The facts and reasoning on which the CAFC found enablement in *In re Wands* are applicable to the same finding of enablement here. In the *Wands* case, the Office erred in rejecting the Applicant's claim to immunoassay methods using a specified generic class of antibodies. The Applicant made a public deposit of a hybridoma cell line that secreted only a specific antibody, yet the CAFC found those skilled in the monoclonal antibody art could, using the state of the art and Applicant's written disclosure, produce and screen other hybridomas secreting other monoclonal antibodies falling within the generic class without undue experimentation.

The technology in *Wands* is similar to the technology described in the present specification in the sense that the person of ordinary skill in the art is prepared to screen additional polymorphisms in the region specified by claims 1 and 42. The specification has disclosed a region of the human genome associated with breast cancer, and the person of ordinary skill in the art now (i) is guided to that region, and (ii) motivated to routinely identify any other polymorphisms in the region associated with breast cancer, should they exist. Further, multiple screening methods are well-known in the art, as described above, and suited to automated screening platforms. Thus, the rationale in *In re Wands* is applicable to a finding of enablement here.

These factors, coupled with the high level of skill in the art for technology pertaining to the pending claims, leads to the conclusion that any experimentation associated with the full claim scope is routine and not undue. Accordingly, the specification provides an enabling disclosure of the claimed subject matter consistent

with 35 U.S.C. 112, first paragraph. Applicant therefore respectfully requests withdrawal of the rejection.

Rejection for Alleged Anticipation

The Office rejected claims 56, 58 and 60 under 35 U.S.C. 102(b) for alleged anticipation by Severin. Applicant respectfully requests clarification of the rejection as there was no claim 60 pending as of the time the Office issued the action. The rejection, however, is moot given the cancellation of claims 56-59, and withdrawal of the rejection respectfully is requested.

### CONCLUSIONS

Applicant respectfully submits all pending claims will be in condition for allowance upon entry of the amendments herein. Applicant respectfully solicits a prompt notification to this effect, and the Examiner is encouraged to contact the undersigned representative (contact information below) to promptly resolve any remaining issues or questions.

In the unlikely event a relevant document is separated from this Amendment and the Office determines that an extension and/or other relief is required, Applicant petitions for any required relief, including extensions of time, and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-3473**.

Respectfully submitted,

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